

**USE OF VIRTUAL ENVIRONMENTS FOR  
SIMULATION OF ACCIDENT  
INVESTIGATIONS**

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# INTRODUCTION

- Synopsis of how AAI training is currently done
- Illustrate needs of academia, military and industry
- The VR & VL environment
- How can/efficacy of VR supplement AAI Training
- Pro's & Con's of Simulation
- Costs
- Bringing to market

# PROBLEM STATEMENT

The problem associated with traditional static laboratories (TSL) (hands-on) AAI education and training is that it currently presents limitations in the abilities of the user (academics or safety industry) to responsively facilitate specialized education and training needs. Industry safety professionals have limited access to TSL AAI education and training.

# RESEARCH QUESTION

What is the potential educational benefit to engaging industry learners in the operational aspects of AAI through the application of virtual simulation.



# AAI EDUCATION & TRAINING TODAY

- Education vs. Training
- Who (in general) needs training and why?
- Why do entities or the government send untrained individuals to conduct AAI?
- Who performs AAI education & training?

# AAI EDUCATION & TRAINING TODAY CONT

Entity	Scope	Educational and Training Capabilities
Consultants and small enterprise AAI entities	Provide targeted AAI training.	<ul style="list-style-type: none"><li>○ Training is usually specialized to a targeted audience</li></ul>
Vocational/ Professional associations and entities	Provide targeted AAI training at a somewhat larger scale Can lead to certifications or credentials from self-accredited entities. These are a provided by various professional and higher education entities.	<ul style="list-style-type: none"><li>○ Regularly scheduled training</li><li>○ Diverse and relevant knowledge imparted</li></ul>
Higher Education	Provides theory on aviation safety and AAI related discipline. Programs offered from a degree awarding, accredited institution. Graduates from these programs are ready for employment in the safety industry.	<ul style="list-style-type: none"><li>○ Imparts broad knowledge and deeper understanding in well defined, relevant programs.</li><li>○ Usually offered at Associates and Bachelor of Science granting institutions.</li></ul>
Am I missing any non-govt places?		<ul style="list-style-type: none"><li>○</li></ul>

# WHERE IS AAI TRAINING CONDUCTED

Agency	Scope	Educational and Training Capabilities
NTSB	An independent board for civil and some public use accidents in the US.	<ul style="list-style-type: none"> <li>○ Hosts NTSB Training Center <ul style="list-style-type: none"> <li>▪ Hosts approx 15 two day to 2 week courses a year</li> <li>▪ Aviation courses offered <ul style="list-style-type: none"> <li>• AS101 AAI</li> <li>• AS 301 AAI for Professionals</li> <li>• AS302 Survival Factors in Avn Accidents</li> <li>• AS103 Helicopter Accident Investigation</li> </ul> </li> </ul> </li> </ul>
FAA	Responsible for aviation safety and supports the NTSB in AAI Operationalizes NTSB recommendations	<ul style="list-style-type: none"> <li>○ FAA Academy provides workforce and industry technical and management training <ul style="list-style-type: none"> <li>▪ There are safety courses but no AAI coursework</li> </ul> </li> </ul>
DOT	Hosts the Aviation Safety Division to provide AAI training to FAA, DOT, DOD, NTSB, industry and others.	<ul style="list-style-type: none"> <li>○ ASD contains the Transportation Safety Institute <ul style="list-style-type: none"> <li>▪ Offers 11 aviation safety courses <ul style="list-style-type: none"> <li>• Seven AAI courses offered</li> </ul> </li> </ul> </li> </ul>
Military	Conducts AAI for military services	<ul style="list-style-type: none"> <li>○ Service dependent training courses <ul style="list-style-type: none"> <li>▪ US Army <ul style="list-style-type: none"> <li>• Professional level safety management</li> <li>• AAI specific course</li> <li>• Heavy prerequisites</li> </ul> </li> <li>▪ US Air Force <ul style="list-style-type: none"> <li>• Professional level safety management</li> <li>• AAI specific courses</li> <li>• Some prerequisites</li> </ul> </li> <li>▪ US Navy and Marine Corps <ul style="list-style-type: none"> <li>• Mostly safety management</li> <li>• No specific AAI coursework evident</li> <li>• Some prerequisites</li> </ul> </li> <li>▪ US Coast Guard <ul style="list-style-type: none"> <li>• Training is received offered through external agencies;</li> </ul> </li> </ul> </li> </ul>

# NEEDS OF THE INDUSTRY

- AAI occurs for corrective actions, punishment, or compensation (Lewis, 2011).
- Industry must retain AAI knowledge in support of the conduct of AAI
  - Manufacturers
  - Regulators
  - Operators
- All actions (learning, practicing, conducting AAI) are logically linked to a lawful structure-investigation process



# NEEDS OF THE INDUSTRY CONT.

- AAI must also support “other” parties to an investigation (govt or non-govt)
- Increased air travel = increased risk potential
- Industry forecasts indicate growth
- Affects of increased demand imply challenges in fleets
- Load to industry implies need to support in all areas of operation

# **COSTS ASSOCIATED WITH LEARNING/ TRAINING**

- **Currency of knowledge in a technologically advancing industry driven by:**
  - Reliability and Liability
  - Increased risk from non-trained
- **CPE often first budget cut**
- **Industry saves resources by not maintaining broad training, but by limiting to required area**
- **Industry will retain broad expertise where operators may not**

# COSTS ASSOCIATED WITH LEARNING/ TRAINING

AAI Course	Location	Onsite Lab	Length	Cost
NTSB AS-101 Aircraft Accident Investigation	Ashburn, VA	X (Comm/GA)	2 weeks	\$4000
Training Safety Institute (DOT) Basic AAI	Oklahoma City, OK	X	10 days	\$2100
Southern California Safety Institute. AAI	Long Beach, CA	X (GA)	10 days	\$3300
ERAU OPE AAI and Management	Daytona Beach, FL	X	5 days	\$2000
			Average	\$2850

## Factors affecting decision to send to training:

- Travel
- Workers away
- Facilities
- On site expertise.
- Ability to Modularize
- Limitations to hands on training areas available

# USES OF THE VL ENVIRONMENT

- Science labs
- Engineering
- Flight training
- Military

# HOW CAN/EFFICACY OF VR SUPPLEMENT AAI TRAINING

- Easily modularized
- Easily updated
- Cost effective
- Accessibility
- Flexibility
- Connectivist networkability

# PROS/CONS OF SIMULATION

- What is VR and how is it used in the learning environment.
- Pros
  - Technology harnessing (Oculus)
  - Flexibility to modularize
  - Scenario specialization capability
- Cons
  - Fidelity is always an issue
  - Transportability

# **PEDAGOGY FOR SCENARIO BASED TRAINING**

- **Scenario based capabilities**
- **Company specializations**

# QUALITY IS OUR JOB

QUALITY REQUIRES A TEAM EFFORT ....  
WE CAN LEARN FROM OTHERS ON THE  
IMPORTANCE OF THIS

